

Feeding and Eating Disorders in Young People with Type 1 Diabetes: A Systematic Review

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| Received: 08.08.2024 | Accepted: 14.09.2024 | Published: 03.10.2024

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Abstract

Review Article

Eating disorders (ED) are a growing concern among young individuals with type 1 diabetes (T1D), with a prevalence significantly higher than that observed in the general adolescent population. Studies indicate that adolescents with diabetes are 2 to 3 times more likely to develop ED compared to their non-diabetic peers. This increased prevalence is partly attributed to several risk factors unique to this population. Adolescence itself is a major risk factor for ED, characterized by hormonal fluctuations, rising concerns about body image, and experimental eating behaviors. However, for young people with T1D, these risks are exacerbated by additional challenges. Daily diabetes management, which involves rigorous monitoring of blood glucose levels and precise control of dietary intake, can contribute to increased stress and excessive preoccupation with weight and body shape. Furthermore, social expectations and pressures related to glycemic control can reinforce problematic eating behaviors. ED in young diabetics can have severe consequences on diabetes management and overall health. Restrictive eating or purging behaviors can lead to glycemic imbalances, poor diabetes control, and increased risk of associated complications. This can also worsen psychological difficulties, such as anxiety and depression, thereby amplifying the cycle of deteriorating mental and physical health. Effective management of ED in young diabetics requires a multidisciplinary approach. It is crucial to integrate interventions that address not only nutritional and psychological aspects but also the specific challenges related to managing T1D. Early detection and treatment of ED can improve clinical outcomes and promote a better balance between diabetes management and the mental health of patients.

Keywords: Feeding and eating disorders, diabetes, bulimia, child and adolescent psychiatry.**Copyright © 2024 The Author(s):** This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

Diabetes is a chronic metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which over time leads to serious damage to the heart, blood vessels, eyes, kidneys, and nerves. Among the types of diabetes, Type 1 diabetes, once known as juvenile diabetes or insulin-dependent diabetes, is a chronic condition in which the pancreas produces little or no insulin on its own. In 2017, there were 9 million people living with Type 1 diabetes globally.

In this population, there is an increased risk of psychological disorders, such as anxiety, depression, and feeding and eating disorders, particularly when diabetes develops during preadolescence—a period marked by rapid physical and psychological changes.

The onset of insulin-dependent diabetes (IDD) during childhood or adolescence significantly alters

these young patients' relationship with food. Studies have shown that eating disorders are more common in patients with Type 1 diabetes than in the general population. This may be attributable to several factors including the focus on diet and glycaemia, the increased emphasis on maintaining a healthy weight, risk of insulin-related weight gain and associated body dissatisfaction; However, their presentation is generally atypical and often goes unrecognized.

Misuse of insulin is also frequently observed, with insulin being used as a means of controlling energy expenditure. Such behaviors have negative medical outcomes.

Definition of Feeding and eating disorders:

Eating disorders are significant mental health issues that are becoming increasingly common around the globe. These disorders often occur alongside other psychiatric conditions and are associated with high

mortality rates. Due to the challenges in treating them, there is a growing emphasis on prevention and early intervention, particularly when symptoms first appear, usually during adolescence. Unfortunately, effective prevention strategies are still lacking. Feeding and eating disorders, as describes in DSM-5 TR, are characterized by a persistent disturbance of eating or eating-related behavior that results in the altered consumption or absorption of food and that significantly impairs physical health or psychosocial functioning. Some individuals with feeding and eating disorders report eating-related symptoms resembling those typically endorsed by individuals with substance use disorders, such as craving and patterns of compulsive use. This resemblance may reflect the involvement of the same neural systems, including those implicated in regulatory self-control and reward, in both groups of disorders.

Typically, three disorders are often, but not always, associated with infancy and early childhood: pica, rumination disorder, and avoidant/restrictive food intake disorder (formerly known as feeding disorder of infancy or early childhood). However, anorexia nervosa, bulimia nervosa, and binge-eating disorder are more commonly seen in adolescents and young adults.

Prevalence of different eating disorders among individuals with type 1 diabetes reported in the literature

Eating disorders (EDs) among young individuals with Type 1 diabetes (T1D) represent a significant clinical concern, given the complex interplay between diabetes management and psychological challenges. All EDs share an intense focus on food-related concerns and weight control. Among the earliest to highlight this issue, Jones and colleagues reported a significantly higher prevalence of EDs in adolescent females with T1D compared to their non-diabetic counterparts, with rates of 10% versus 4%, respectively. This elevated prevalence is particularly pronounced among young women and varies according to the type of ED. While the prevalence of anorexia nervosa appears comparable to that in the general population, ranging from 0.3% to 1.5%, bulimia nervosa is more frequent in young individuals with T1D, with rates between 1% and 2%. Atypical or unspecified eating disorders are also two to three times more common than in the general population, with rates between 4% and 8%.

Young *et al.*, in their systematic review on eating disorders in adolescents with T1D, reported that disordered eating behaviors are more prevalent in adolescents with T1D compared to their non-diabetic peers (39.3% vs. 32.5% for disordered eating behavior; 7.0% vs. 2.8% for eating disorders).

A study by Nip *et al.*, found a prevalence of 21.2% for EDs among young people with T1D, with a notable gender difference: 12.2% in boys and 30.2% in girls. Another Norwegian study demonstrated that

problematic eating behaviors increase with age and body mass index, with this trend being particularly pronounced in older adolescents (ages 17-19) compared to younger ones (ages 11-13).

Regarding anorexia nervosa, the available studies are fewer and present mixed results. Some research without control groups reported cases of anorexia nervosa in young individuals with T1D, while more recent controlled studies have not shown a significant difference between diabetic and non-diabetic subjects. Nevertheless, when this association is present, it is linked to a very high mortality rate, reaching up to 34.8%.

Bulimia nervosa has been significantly observed in several case-control studies, indicating a higher prevalence among individuals with T1D compared to controls. Unspecified eating disorders, often in the form of binge eating disorder, are also more frequent in young people with T1D, with some studies showing prevalence rates up to twice as high as those in the general population.

Etiopathogenesis and Risk Factors

There is no clear demonstration of a specific link between EDs and type 1 diabetes, glycemic fluctuations, which are unique to individuals with diabetes, may influence hunger sensations, thereby disrupting hunger and satiety signals. The need to maintain metabolic balance imposes strict rules on meal timing, as well as on the quantity and quality of food intake, which could potentially foster the development of binge-purge cycles. These dietary constraints may exacerbate body dissatisfaction, loss of control, and low self-esteem, particularly in vulnerable individuals.

Adolescence, marked by intense physical and psychological changes, coincides with the gradual realization of bodily and psychic identity. This period often encourages the adoption of weight-control practices, driven by the social valorization of thinness. Body weight, body image, and eating behaviors are thus influenced not only by the demands of diabetes management but also by the broader psychosocial context, thereby increasing the vulnerability of these adolescents to eating disorders.

Studies have highlighted various psychosocial and environmental risk factors. Maharaj *et al.*, conducted a systematic study among young diabetic girls, revealing an association between disordered eating behaviors, poor metabolic control, and family dysfunction. The results showed that young girls with both EDs and type 1 diabetes perceive rejection, poor communication, and low trust in their parents' responses to their needs. These relational deficits are associated with problematic eating behaviors, such as insulin omission, binge eating, self-induced vomiting, and laxative use.

In France, Tubiana-Rufi *et al.*, conducted a multicenter study that demonstrated that families of diabetic children exhibit lower levels of cohesion and adaptability compared to families of non-diabetic children. Children from families with rigid functioning had a higher number of hypoglycemic and ketoacidosis episodes.

Consequences of Eating Disorders in the Diabetic Population

When faced with any unexplained glycemic imbalance, it is crucial for healthcare providers to consider the possibility of an eating disorder (ED), especially in young women. Friedman *et al.*, did not find a direct correlation between EDs (distinguishing between anorexic and bulimic behaviors) and somatic complications. It is primarily glycemic imbalance and the duration of type 1 diabetes that predict an increased risk of somatic complications. Takii *et al.*, reported that 40.9% of the 22 bulimic diabetic patients had retinopathy.

Bryden suggests that it is the lack of insulin, rather than the disordered eating behaviors themselves, that leads to somatic complications. Misuse of insulin is frequently observed, with insulin being used as a means of controlling energy expenditure. Such behaviors have negative medical outcomes, including poor metabolic control, increased frequency of hospitalizations for episodes of ketoacidosis or hypoglycemia, and a higher incidence of chronic diabetes-related complications, particularly retinopathy and peripheral neuropathies.

Complications are not only somatic but also impact quality of life. Nip *et al.*, studied the global impact of EDs beyond glycemic control. Patients with EDs exhibit significantly more depressive symptoms and a reduced quality of life, which is particularly alarming in these young patients. Regarding life expectancy, there are few long-term studies on these populations. Goebel-Fabbri *et al.*, conducted an 11-year follow-up study of women with type 1 diabetes (234 women, aged 45 on average at the end of the study, with a mean diabetes duration of 28 years). It was found that 30% of participants reported insulin dose restriction at the start of the study. Multivariate analysis, after adjustment, showed that this restriction was associated with a significantly increased risk of death, tripling the risk. Moreover, the age of death was significantly younger in these "insulin restrictors" compared to "appropriate insulin users" (45 years versus 58 years, respectively; $p < 0.01$). They also had more eating disorders and more complications such as renal issues and diabetic foot problems.

Additionally, when type 1 diabetes is associated with anorexia nervosa, increased morbidity and mortality are observed. Nielsen *et al.*, found a mortality rate of 34.8% in patients with this comorbidity, compared to 6.5% for anorexia nervosa alone and 2.5% for type 1

diabetes alone. Walker *et al.*, reported a comparable mortality rate (36%), as well as earlier and more frequent complications, including two cases of blindness and five cases of end-stage renal disease.

CONCLUSION

The literature indicates that eating disorders (ED) may be twice as prevalent among individuals with type 1 diabetes (T1D). While it is generally agreed that ED and disordered eating are disproportionately represented in this population, prevalence rates can vary significantly, ranging from 1% in pre-adolescents to between 30% and 39% in adolescents and adults with T1D. Various theories have been proposed to account for the high prevalence of eating disorders among those with T1D. It appears that specific characteristics commonly found in these individuals may heighten the influence of genetic, social, and environmental factors involved in the development of ED. Managing eating disorders in patients with T1D is particularly complex. It requires a multidisciplinary team with expertise in addressing the nutritional, psychological, and environmental aspects, as well as the specific issues related to T1D and its treatment.

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